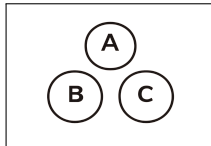
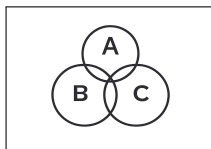


20 Discrete Distribution Exp Value / Variance

D



$$n = 6$$
$$p = \frac{1}{2}$$



$$E[X] = np = 6 \cdot \frac{1}{2} = \boxed{3}$$

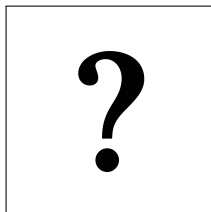
$$\text{Var}(X) = np(1 - p) = 3 \cdot \frac{1}{2} = \boxed{\frac{3}{2}}$$

$$E[X^2] = \text{Var}(X) + (E[X])^2$$

$$E[X^2] = \frac{3}{2} + 3^2$$

$$E[X^2] = \frac{3}{2} + 9$$

$$E[X^2] = \boxed{\frac{21}{2}}$$



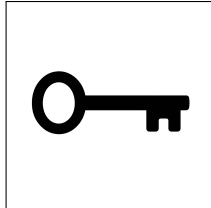
$$P = 1/3$$

$$N = 2$$

$$x = \{0, 1, 2\}$$

20 Discrete Distribution Exp Value / Variance

D



$$P = 1/3$$
$$N = 2$$
$$x = \{0, 1, 2\}$$

$$P(X = 0) = \binom{2}{0} \frac{1}{3}^0 \frac{2}{3}^2 = \frac{4}{9} = 0.4444$$
$$P(X = 1) = \binom{2}{1} \frac{1}{3}^1 \frac{2}{3}^1 = \frac{4}{9} = 0.4444$$
$$P(X = 2) = \binom{2}{2} \frac{1}{3}^2 \frac{2}{3}^0 = \frac{1}{9} = 0.1111$$

$$E[X] = np = 2 \cdot \frac{1}{3} = \frac{2}{3} \approx \boxed{0.6667}$$

$$\text{Var}(X) = np(1 - p) = 2 \cdot \frac{1}{3} \cdot \frac{2}{3} = \frac{4}{9} \approx \boxed{0.4444}$$

$$\sigma = \sqrt{\text{Var}(X)} = \sqrt{\frac{4}{9}} = \frac{2}{3} \approx \boxed{0.6667}$$